

This Page Is Inserted by IFW Operations  
and is not a part of the Official Record

## **BEST AVAILABLE IMAGES**

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

**IMAGES ARE BEST AVAILABLE COPY.**

**As rescanning documents *will not* correct images,  
please do not report the images to the  
Image Problem Mailbox.**

## REMARKS

The present amendment is prepared in accordance with the new revised requirements of 37 C.F.R. § 1.121. A complete listing of all the claims in the application is shown above showing the status of each claim. For current amendments, inserted material is underlined and deleted material has a line therethrough.

Applicants appreciate the thoroughness with which the Examiner has examined the above-identified application. Reconsideration is requested in view of the amendments above and the remarks below.

Applicants note that the restriction requirement has been made final and that claims 1-5 are pending in the application. Claims 6-15 have been withdrawn. New claims 16-20 have been added.

Claim 1 has been rejected under 35 USC 102(e) as being anticipated by U.S. Patent No. 6,435,398 to Hartfield et al. The Examiner contends that Hartfield et al. teach a method for reworking an electronic component with copper or copper/nickel pads containing a nickel layer and overlying gold layer comprising etching the gold layer, then etching the nickel layer followed by treating the etched component to remove products formed during the etching steps and then plating the restored copper surface with a nickel layer followed by a gold layer.

Claim 2 has been rejected under 35 USC 103(a) as unpatentable over U.S. Patent No. 6,435,398 to Hartfield et al. in view of the publication "High Resolution Powder Blast Micromachining" to Wensink.

Hartfield et al. is cited as above but does not teach that the pads are restored to their original position by media blasting. Wensink is cited to teach that media blasting is

suitable for surface preparation prior to plating. The Examiner contends it would have been obvious to one of ordinary skill in the art at the time of the invention to use media blasting to restore the pads to their original condition.

Claims 3-5 have been rejected under 35 USC 103(a) as being unpatentable over U.S. Patent No. 6,435,398 to Hartfield et al.

Regarding claim 3, Hartfield et al. is cited, as applied above, to teach the method of the invention but the Examiner acknowledges does not teach that the gold layer is etched in a cyanide containing solution. The Examiner notes however that a cyanide solution is traditional for etching gold layers, citing col. 6, lines 24-25.

Regarding claim 4, Hartfield et al. is cited as above, and while not teaching that the nickel layer is etched with an alkaline oxidizer containing solution having a pH greater than 12.0, that ENSTRIP EN-86 was commercially available at the invention was made for the purpose of stripping electroless nickel deposits from copper and copper alloys and it would have been obvious to use such a solution to etch the nickel layer.

Regarding claim 5, Hartfield et al. is cited as above, and even though Hartfield et al. does not teach that the etched component is treated using a cyanide containing solution, Official Notice is taken of the fact that a solution of 20% KCN is well known in the electronics etching art suitable for etching a copper thin film. The Examiner contends it would have been obvious to one of ordinary skill in the art to use such a solution to remove deposits from the copper thin film.

Applicants' invention is directed to a method for reworking electronic components with copper or copper/nickel pads containing a nickel layer and an overlying gold layer. The method comprises the steps of etching the gold layer, etching the nickel layer, treating

the etched components to remove products formed during the etching steps and corrosion products and then plating the treated copper surface with a nickel layer followed by a gold layer. An important feature of the invention is to treat the etched component to remove products formed during the etching step and corrosion products. This is discussed in the specification on page 8, the paragraph beginning at line 7, and in the example starting on page 9. In the example it should be noted that between each step the electronic component is rinsed. This is conventional as in Hartfield et al.

Regarding claim 1, anticipation is but the ultimate or epitome of obviousness and in the meaning of 35 USC § 102. *In re Grose et al.* (CCPA 1979) 201 USPQ 57. To constitute anticipation, all material elements of a claim must be found in one prior art source. *In re Marshal* (CCPA 1978) 198 USPQ 344. It is respectfully submitted that claim 1 is properly allowable over Hartfield et al. under 35 USC 102 or 35 USC 103.

It is clear from Hartfield et al., and as acknowledged by the Examiner in the rejection of claim 5, that Hartfield et al. does not teach a treatment step as claimed by Applicants. While Hartfield et al. does teach the successive steps of etching gold and nickel from copper pads, there is no disclosure in the patent regarding the treatment step to remove products formed during the etching step and corrosion products. All that is disclosed in Hartfield et al. is rinsing between etches.

As described in the specification on page 8, the etched substrate is treated to remove products formed during the etching of the nickel layer and corrosion products. It is preferred to use a free cyanide containing solution for the treatment and other solutions that can be used are chromic acid and sodium hydroxide. It is clear that this is not a

rinsing step as shown in Hartfield et al. and it is respectfully submitted that claim 1 is properly allowable over the Hartfield et al. patent.

To further distinguish Applicants' invention from Hartfield et al., Applicants have added new claims 16-20. In claim 16, for example, the treatment step is defined to use an etchant selected from a free cyanide containing solution, chromic acid and sodium hydroxide. Basis for the amendment may be found on page 8, the paragraph beginning at line 7.

Again, it is clear that Hartfield et al. is deficient as a teaching of Applicants' invention since no treatment steps are disclosed but merely a rinsing step.

The Examiner attempts to cure this deficiency in the rejection of claim 5 by acknowledging that even though Hartfield et al. do not teach the etched component is treated using a cyanide containing solution, that Official Notice is taken of the fact that a solution of 20% KCN as well known in the electronic etching art as suitable for etching a copper thin film. The Examiner contends it would have been obvious to one of ordinary skill in the art to use such a solution treatment to remove deposits from a copper thin film.

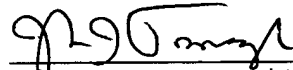
Attached hereto and made a part hereof are pages 7784 and 8757 of the 1996 Merck Index. As can be seen, uses of potassium cyanide include extracting gold and silver from ores, electroplating baths, etc. There is no disclosure that is well known in the electronic etching art for etching a copper thin film. In any event, it is respectfully submitted that even if it is well known to use a KCN solution for etching copper, there is no teaching in Hartfield et al. for using such a treatment step after removal of the gold and nickel layers and before plating of a nickel and gold layer on the "reworked" copper pad. The treatment step as noted above is an important feature of Applicants' invention and it is

respectfully submitted that the Examiner's inclusion of such a step in Hartfield et al. based on Official Notice is unwarranted and that the claims are properly allowable over this reference.

Regarding the rejections of claims 2-5, it is respectfully submitted that these claims are preferred embodiments of main claim 1 and contain all the limitations of claim 1. In view of the above comments it is respectfully submitted that the claims are properly allowable since claim 1 is not disclose nor taught by the prior art.

It is respectfully submitted that the application has now been brought into a condition where allowance of the case is proper. Reconsideration and issuance of a Notice of Allowance are respectfully solicited. Should the Examiner not find the claims to be allowable, Applicants' attorney respectfully requests that the Examiner call the undersigned to clarify any issue and/or to place the case in condition for allowance.


Respectfully submitted,

  
 John J. Tomaszewski  
 Reg. No. 26,241

**DeLIO & PETERSON, LLC**  
 121 Whitney Avenue  
 New Haven, CT 06510-1241  
 (203) 787-0595  
 ibmb100321000amdC

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service on the date indicated below as first class mail in an envelope addressed to the Mail Stop Non-Fee Amendment, Commissioner of Patents, P. O. Box 1450, Alexandria, VA 22313-1450.

Name: Carol M. Thomas Date: May 4, 2004 Signature:   
 lbmf100340000amdA

# THE MERCK INDEX

AN ENCYCLOPEDIA OF  
CHEMICALS, DRUGS, AND BIOLOGICALS

TWELFTH EDITION

Susan Budavari, *Editor*  
Maryadele J. O'Neil, *Senior Associate Editor*  
Ann Smith, *Associate Editor*  
Patricia E. Heckelman, *Assistant Editor*  
Joanne F. Kinneary, *Assistant Editor*

*Published by*  
*Merck Research Laboratories*  
*Division of*

**MERCK & CO., INC.**

Whitehouse Station, NJ

1996

THERAP CAT: Electrolyte replenisher.  
THERAP CAT (VET): Potassium supplement.

**7784. Potassium Chromate(VI).** Neutral potassium chromate.  $\text{CrK}_2\text{O}_4$ ; mol wt 194.19. Cr 26.78%, K 40.27%, O 32.96%.  $\text{K}_2\text{CrO}_4$ .

Lemon-yellow crystals; d 2.73; mp 975°. Sol in 1.6 parts cold, 1.2 parts boiling water. Insol in alcohol. The aq soln is alkaline to litmus or phenolphthalein.

USE: Has a limited application in enamels, finishing leather, rustproofing of metals, being replaced by the sodium salt; as reagent in analytical chemistry.

**7785. Potassium Citrate.** Urocit-K.  $\text{C}_6\text{H}_5\text{K}_3\text{O}_7$ ; mol wt 306.40. C 23.52%, H 1.64%, K 38.28%, O 36.55%.  $\text{K}_3\text{C}_6\text{H}_5\text{O}_7$ . It is at least 99% pure.

Monohydrate, white crystals, granules or powder. Loses its water at 180°. One gram dissolves in 0.65 ml water; very slowly in 2.5 ml glycerol. Practically insol in alcohol. The aq soln is alkaline to litmus; pH about 8.5.

THERAP CAT: Antilithic. Antacid.

THERAP CAT (VET): Diuretic.

**7786. Potassium Citrate, Monobasic.** Monopotassium citrate.  $\text{C}_6\text{H}_7\text{KO}_7$ ; mol wt 230.22. C 31.30%, H 3.06%, K 16.98%, O 48.65%.  $\text{KH}_2\text{C}_6\text{H}_5\text{O}_7$ .

White, cryst powder. Sol in water; the soln is subject to molding.

USE: A 0.05 molal solution as standard for pH scale (pH at 25° 3.776). Staples, Bates, *J. Res. Nat. Bur. Stand.* 73A, 37 (1969).

**7787. Potassium Cobaltous Selenate.**  $\text{CoK}_2\text{O}_4\text{Se}_2$ ; mol wt 423.05. Co 13.93%, K 18.48%, O 30.26%, Se 37.33%.  $\text{K}_2\text{Co}(\text{SeO}_4)_2$ . Prepd by evaporating a soln of the component salts: von Hauer, *Sitzungsber. Akad. Wien* 39, 839 (1860).

Hexahydrate, garnet-red monoclinic crystals. d 2.514. Stable in air.

**7788. Potassium Cyanate.**  $\text{CKNO}$ ; mol wt 81.12. C 14.81%, K 48.20%, N 17.27%, O 19.72%. Inhibitor of the sickling of erythrocytes *in vitro*: Cerami, Manning, *Proc. Nat. Acad. Sci. USA* 68, 1180 (1971). See also Sodium Cyanate. Pharmacology: Cerami *et al.*, *J. Pharmacol. Exp. Ther.* 185, 653 (1973).

White, cryst powder. d 2.05. Sol in water, very slightly in alcohol.  $\text{LD}_{50}$  i.p. in mice: 320 mg/kg.

**7789. Potassium Cyanide.**  $\text{CKN}$ ; mol wt 65.12. C 18.45%, K 60.04%, N 21.51%. KCN. The article of commerce contains about 95% KCN. Toxicity study: Hayes, *Toxicol. Appl. Pharmacol.* 11, 327 (1967).

White, deliquescent, granular powder or fused pieces; odor of HCN. *Violent poison!* On exposure to air it is gradually dec by  $\text{CO}_2$  and moisture. d 1.52; mp 634°. Sol in 2 parts cold, 1 part boiling water, 2 parts glycerol, 100 parts alcohol, 25 parts methanol. The aq soln is strongly alkaline and rapidly dec. pH of 0.1N aq soln: 11.0. *Keep tightly closed and protected from light. Incompat.* Acids and acid syrups; alkaloids, chloral hydrate, iodine, metallic salts, permanganates, chlorates, peroxides.  $\text{LD}_{50}$  orally in rats: 10 mg/kg (Hayes).

*Caution:* Potential symptoms of overexposure are weakness, headache and confusion; nausea, vomiting; increased rate of respiration; slow gasping respiration; irritation of eyes and skin; asphyxia and death can occur. See *NIOSH Pocket Guide to Chemical Hazards* (DHHS/NIOSH 90-117, 1990) p 76.

USE: Similar to sodium cyanide.

**7790. Potassium Dichromate(VI).** Potassium bichromate.  $\text{Cr}_2\text{K}_2\text{O}_7$ ; mol wt 294.18. Cr 35.35%, K 26.58%, O 38.07%.  $\text{K}_2\text{Cr}_2\text{O}_7$ . In the U.S.A. it is usually prepared by the reaction of potassium chloride on sodium dichromate: Vetter in Kirk-Othmer *Encyclopedia of Chemical Technology* vol. 3 (Interscience, New York, 1949) p 951; Hartford, Copson, *ibid.* vol. 5 (2nd ed., 1964) pp 484-488. In Germany it is obtained from potassium chromate produced by roasting the chrome ore with KOH. Ref: Müller, Glissmann in *Ullmann's Encyklopädie der Technischen Chemie*, vol. 5 (Munich, 3rd ed., 1954) p 580.

Bright orange-red crystals. Not hygroscopic or deliquescent (difference from sodium dichromate). Crystal habit: prismatic. Crystal system: triclinic pinacoidal, transition to monoclinic at 241.6°.  $d_{25}^{20}$  2.676. Bulk density: 100 lbs/cu ft. mp 398°. Dec at about 500°. Heat of fusion 29.8 cal/g. Heat of soln -62.5 cal/g. Specific heat 0.186 at 16° -98°. Soluble in water. A satd aq soln contains at 0°: 4.3%, at 20°: 11.7%, at 40°: 20.9%, at 60°: 31.3%, at 80°: 42.0%, at 100°: 50.2%. Acid reaction: A 1% aq soln has a pH of 4.04 and a 10% soln has a pH of 3.57.

*Caution:* Intern. a corrosive poison. Industrial contact may result in ulceration of hands, destruction of mucous membranes and perforation of nasal septum. See E. Browning, *Toxicity of Industrial Metals* (Appleton-Century Crofts, New York, 2nd ed., 1969) pp 119-131. See also Chromium.

USE: In tanning leather, dyeing, painting, decorating porcelain, printing, photolithography, pigment-prints, staining wood, pyrotechnics, safety matches; for bleaching palm oil, wax, and sponges; waterproofing fabrics; as oxidizer in the manuf of organic chemicals; in electric batteries; as depolarizer for dry cells. As corrosion inhibitor in preference to sodium dichromate where lower soly is advantageous. Pharmaceutical aid (oxidizing agent).

THERAP CAT (VET): Caustic.

**7791. Potassium Dicyanoaurate(I).** Gold potassium cyanide; potassium aurocyanide.  $\text{C}_2\text{AuKN}_2$ ; mol wt 288.10. C 8.34%, Au 68.37%, K 13.57%, N 9.72%.  $\text{KAu}(\text{CN})_2$ . Prepd by electrolysis of Au in KCN: Glassford, Napier, *Phil. Mag.* 25, 61 (1844).

Dihydrate, cryst powder. One gram dissolves in 7 ml water, 0.5 ml boiling water; slightly sol in alcohol. Practically insol in ether.

USE: For electroplating.

**7792. Potassium Ferricyanide.** *Tripotassium hexakis(cyano-C)ferrate(3-); potassium hexacyanoferrate(III);* red prussiate of potash.  $\text{C}_6\text{FeK}_3\text{N}_6$ ; mol wt 329.25. C 21.89%, Fe 16.96%, K 35.63%, N 25.53%.  $\text{K}_3\text{Fe}(\text{CN})_6$ .

Ruby-red crystals. d 1.89. Slowly sol in 2.5 parts cold water, in 1.3 parts boiling water; slightly sol in alc; dec by acids. The aq soln dec slowly on standing. *Protect from light.*

USE: Chiefly for blueprints; in photography; also for staining wood, dyeing wool, calico printing, as etching liquid (Mercer's liquor), tempering iron and steel; in electroplating; as a mild oxidizing agent in organic synthesis; in analytical chemistry.

**7793. Potassium Ferrocyanide.** *Tetrapotassium hexakis(cyano-C)ferrate(4-); potassium hexacyanoferrate(II);* yellow prussiate of potash.  $\text{C}_6\text{FeK}_4\text{N}_6$ ; mol wt 368.34. C 19.56%, Fe 15.16%, K 42.46%, N 22.82%.  $\text{K}_4\text{Fe}(\text{CN})_6$ . *View of properties, chemistry and syntheses: The Chemistry of Ferrocyanides*, American Cyanamid Co. (Beacon Press, New York, 1953) 112 p.

Trihydrate, soft, slightly efflorescent crystals.  $d_{25}^{20}$  1.885. Lose water at 60°, becomes anhydrous at 100°.

**7794. Potassium Fluoride.**  $\text{FK}$ ; mol wt 58.10. F 32.70%, K 67.30%. KF. Prepd by thermal decomposition of  $\text{KHF}_2$  or by neutralizing HF with  $\text{K}_2\text{CO}_3$ : *Large Scale Synthesis*, Z. Physik. Chem. 129, 285, 286 (1927); Kwanin, *ibid.* *book of Preparative Inorganic Chemistry*, vol. 2, 2nd ed., 1963, p 23.

Ed. (Academic Press, New York, 2nd ed., 1963) p 23. Cubic crystals (NaCl lattice). Usually obtained as deliquescent powder or solid. *Poisonous!* d 2.401. mp 857° bp 1505°. Soly in water (g/100 ml): 92.3 (15°), 100 (20°), 100 (30°). Very freely sol in boiling water. Also sol in  $\text{NH}_3$ . Insol in alcohol unless water is present. Stored in aluminum containers. *Caution:* Attracts moisture from the air. Aq solns corrode glass and porcelain.

orally in guinea pigs: 250 mg/kg.

Dihydrate, monoclinic crystals. mp 418° (18°): 349.3 g/100 ml.

Tetrahydrate, crystals, mp 19.3°.

*Caution:* Irritating to skin, eyes, mucous membranes.

USE: In the fluorination of organic compounds; as hard solder; to prevent unwanted fermentation; as ticide formulations; for frosting glass.



**8749. Sodium Cyanate.** *Cyanic acid sodium salt.* CN-NaO; mol wt 65.01. C 18.48%, N 21.55%, Na 35.37%, O 24.61%. NaOCN. Prepn and properties: *Gmelin's, Sodium* (8th ed.) 21, 799-801 (1928) and supplement, part 4, 1382-1386 (1967). Used experimentally in treatment of sickle cell anemia. Effect of cyanate on sickling: May *et al.*, *Lancet* 1, 658 (1972); P. N. Gillette *et al.*, *N. Engl. J. Med.* 290, 654 (1974). Pharmacology and toxicology: Cerami *et al.*, *J. Pharmacol. Exp. Ther.* 185, 653 (1973). Clinical studies: Peterson *et al.*, *ibid.* 189, 577 (1974).

Colorless needles from alcohol.  $d_4^{20}$  1.893. mp 550°. Sol in water; decomposes to form  $\text{Na}_2\text{CO}_3$  and urea. Soly in alc (0°): 0.22 g/100 g solvent. Insol in ether. LD<sub>50</sub> i.p. in mice: 260 mg/kg (Cerami).

**8750. Sodium Cyanide.** *Cyanogran.* CNNa; mol wt 49.01. C 24.51%, N 28.58%, Na 46.91%. NaCN. This cyanide of commerce is 95-98% pure. Mixtures of sodium cyanide with sodium chloride or carbonate for special uses are also marketed. Toxicity study: Smyth *et al.*, *Am. Ind. Hyg. Assoc. J.* 30, 470 (1969).

White granules or fused pieces. *Violent poison!* Odorless when perfectly dry; somewhat deliquescent in damp air and emits slight odor of HCN. mp 563°. Freely sol in water, slightly in alcohol. The aq soln is strongly alkaline and rapidly decomposes; the soln readily dissolves gold and silver in presence of air. *Keep well closed.* LD<sub>50</sub> orally in rats: 15 mg/kg (Smyth).

**Caution:** Potential symptoms of overexposure are weakness, headache and confusion; nausea, vomiting; increased rate of respiration; slow gasping respiration; irritation of eyes and skin; asphyxia and death can occur. See *NIOSH Pocket Guide to Chemical Hazards* (DHHS/NIOSH 90-117, 1990) p 76.

**USE:** Extracting gold and silver from ores; electroplating baths; fumigating citrus and other fruit trees, ships, railway cars, warehouses, etc.; manuf hydrocyanic acid and many other cyanides; case hardening of steel.

**8751. Sodium Cyanoborohydride.** *Sodium (cyano-C)-trihydroborate(I-);* sodium borocyanohydride; sodium cyanohydridoborate.  $\text{CH}_3\text{BNNa}$ ; mol wt 62.84. C 19.11%, H 4.81%, B 17.20%, N 22.29%, Na 36.58%.  $\text{NaBH}_3\text{CN}$ . Reducing agent prepared from  $\text{NaBH}_4$  and HCN: R. C. Wade *et al.*, *Inorg. Chem.* 9, 2146 (1970); R. C. Wade, Ger. pat. 2,028,569 corresp to U.S. pat. 3,667,923 (1971, 1972 both to Ventron). Review of prepn, properties and use: C. F. Lane, *Synthesis* 1975, 135-146.

White, hygroscopic powder, mp 240-242° (dec).  $d_4^{28}$  1.199. Soly (g/100 g solvent) in water (29°): 212; in THF (28°): 37.2; in diglyme (25°): 17.6. Very sol in methanol; slightly sol in ethanol, isopropylamine; insol in ethyl ether, benzene, hexane. Stable in acid to pH 3; undergoes rapid hydrolysis in 12N HCl. Rate of hydrolysis  $10^{-8}$  that of  $\text{NaBH}_4$ .

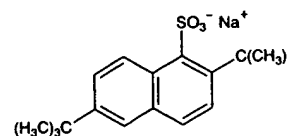
**USE:** Selective reducing agent for aldehydes, ketones, oximes, enamines; does not reduce amides, ethers, lactones, nitriles, nitro compds and epoxides. Also used for reductive amination of ketones and aldehydes, reductive alkylation of amines and hydrazines, reductive displacement of halides and tosylates, deoxygenation of aldehydes and ketones. See Lane, *loc. cit.*

**8752. Sodium Diacetate.** *Sodium acid acetate;* Dykon.  $\text{CH}_3\text{COONa} \cdot \text{CH}_3\text{COOH}$ . Described as a "bound" compd of sodium acetate and acetic acid.

White powder, dec above 150°. Sol in water, liberating 42.25% available acetic acid.

**USE:** Acetic acid in solid form; as an inhibitor of molds and rope-forming bacteria in bread: Glabe, *Food Inds.* 14, no. 2, 46 (1942); as sequestrant.

**8753. Sodium Dibunate.** *2,6-Bis(1,1-dimethylethyl)-1-naphthalenesulfonic acid sodium salt;* L-1633; 1633 Labaz; Becantex; Dibunafon; Keuten; Linctussal.  $\text{C}_{18}\text{H}_{21}\text{NaO}_3\text{S}$ ; mol wt 342.43. C 63.14%, H 6.77%, Na 6.71%, O 14.02%, S 9.36%. Although most sources refer to this compound as sodium 2,6-di-*tert*-butylnaphthalene sulfonate, it is a mixture of at least two isomers. Prepn and separation of isomers: Menard *et al.*, *Can. J. Chem.* 39, 729 (1961).



Slightly hygroscopic crystals, dec > 300°. Slightly sol in cold water (0.5-1.0%); freely sol in hot water; sol in methanol, less sol in ethanol. Aq solns are stable to boiling.

**THERAP CAT:** Antitussive.

**8754. Sodium Dichromate(VI).** *Sodium bichromate;* bichromate of soda.  $\text{Cr}_2\text{Na}_2\text{O}_7$ ; mol wt 261.97. Cr 39.70%, Na 17.55%, O 42.75%.  $\text{Na}_2\text{Cr}_2\text{O}_7$ . Usually prepd from  $\text{Na}_2\text{CrO}_4$  and  $\text{H}_2\text{SO}_4$ . Description of industrial processes: Müller, Glissmann in *Ullmann's Encyklopädie der Technischen Chemie* vol. 5 (Munich, 3rd ed., 1954) p 575; Faith, Keyes & Clark's *Industrial Chemicals*, F. A. Lowenheim, M. K. Moran, Eds. (Wiley-Interscience, New York, 4th ed., 1975) pp 731-736.

Dihydrate, reddish to bright orange, somewhat deliquescent crystals. Crystal system: monoclinic sphenoidal. Crystal habit: elongated prismatic.  $d_4^{25}$  2.348. Bulk density: 96 lbs/cu ft. Becomes anhydrous on prolonged heating at ~100°. The anhydrous salt mp 356.7° and starts to dec at ~400°. Heat of soln -28.2 cal/g. Very sol in water. A satd aq soln contains at 0°: 70.6%  $\text{Na}_2\text{Cr}_2\text{O}_7 \cdot 2\text{H}_2\text{O}$ ; at 20°: 73.18%; at 40°: 77.09%; at 60°: 82.04%; at 80°: 88.39%; at 100°: 91.43%. A 20% soln freezes at -3.5°, a 30% soln at -6°, a 60% soln at -26°, a 69% soln at -48°. Specific heat of 20% soln at 25°: 0.85 cal/g°C. Solns are acidic: pH of 1% soln: 4.0; pH of 10% soln: 3.5.

**Caution:** Irritant and caustic to skin, mucous membranes. **USE:** Oxidizing agent in manuf of dyes, many other synthetic organic chemicals, inks, etc.; in chrome-tanning of hides; in electric batteries; bleaching fats, oils, sponges, resins; refining petroleum; manuf chromic acid, other chromates and chrome pigments; in corrosion-inhibitors, corrosion-inhibiting paints; in many metal treatments; electroengraving of copper; mordant in dyeing; for hardening gelatin; for the defoliation of cotton plants and other plants and shrubs, La Lande, U.S. pat. 2,760,854 (1956 to Pennsylvania Salt).

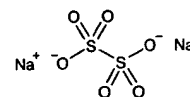
**THERAP CAT:** Anti-infective (topical).

**8755. Sodium Dicyanoaurate(I).** *Gold sodium cyanide;* sodium aurocyanide.  $\text{C}_2\text{AuN}_2\text{Na}$ ; mol wt 271.99. C 8.83%, Au 72.42%, N 10.30%, Na 8.45%.  $\text{NaAu}(\text{CN})_2$ .

White, cryst powder. Sol in water. *Poison!*

**USE:** Goldplating.

**8756. Sodium Dithionite.** *Dithionous acid disodium salt.*  $\text{Na}_2\text{O}_3\text{S}_2$ ; mol wt 206.11. Na 22.31%, O 46.58%, S 31.12%. Prepd according to the equations  $\text{MnO}_2 + 2\text{SO}_2 \rightarrow \text{MnS}_2\text{O}_6$  and  $\text{MnS}_2\text{O}_6 + \text{Na}_2\text{CO}_3 \rightarrow \text{MnCO}_3 + \text{Na}_2\text{S}_2\text{O}_6$ ; de Baat, *Rec. Trav. Chim.* 45, 237 (1926); Pfannstiel, *Inorg. Syn.* 2, 170 (1946).



Dihydrate, colorless, water-clear, orthorhombic crystals. Very stable in air.  $d_4^{28}$  2.189. Loses all of its water of crystn at 110°. When heated to 267° it is dissociated into  $\text{Na}_2\text{SO}_4$  and  $\text{SO}_2$ . Soly in water at 0°: 6.05% (w/w); at 20°: 13.39%; at 30°: 17.32%. Insol in alc.

**8757. Sodium Dodecylbenzenesulfonate.** *Dodecylbenzenesulfonic acid sodium salt;* dodecylbenzene sodium sulfonate; Santomerse #1; Conoco C-50; Conoco SD 40; Conoco C-60.  $\text{C}_{18}\text{H}_{29}\text{NaO}_3\text{S}$ ; mol wt 348.48. C 62.04%, H 8.39%, Na 6.60%, O 13.77%, S 9.20%.  $\text{C}_{12}\text{H}_{25}\text{C}_6\text{H}_4\text{SO}_3\text{Na}$ . Manuf: *Chem. Eng.* 61, no. 6, 372 (1954); Huber *et al.*, *J. Am. Oil Chem. Soc.* 33, 57 (1956); Brit. pat. 761,095; Seaton, U.S. pat. 2,782,230 (1956, 1957 both to Monsanto); Brit. pat. 773,423; Gerhart, Karwacki, U.S. pat. 2,820,056